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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.								
10/563,786	01/06/2006	Nobuo Fuse	2005-1997A	3078								
52349 7590 02/05/2008 WENDEROTH, LIND & PONACK L.L.P. 2033 K. STREET, NW SUITE 800 WASHINGTON, DC 20006			<table border="1"><tr><td colspan="2">EXAMINER</td></tr><tr><td colspan="2">SUMMONS, BARBARA</td></tr><tr><td>ART UNIT</td><td>PAPER NUMBER</td></tr><tr><td>2817</td><td></td></tr></table>		EXAMINER		SUMMONS, BARBARA		ART UNIT	PAPER NUMBER	2817	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

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Office Action Summary

Application No.

10/563,786

Applicant(s)

FUSE, NOBUO

Examiner

BARBARA SUMMONS

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 06 January 2006 (pre-amendment).
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1,2,4,5,7-9,11 and 16-19 is/are rejected.
- 7) ☒ Claim(s) 3,6,10 and 12-15 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 06 January 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date <u>1/6/06</u> | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Drawings

1. The replacement drawing was received on 1/6/06 with the preliminary amendment. This drawing is approved.
2. Figure 14 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated (see the specification at page 13, lines 16-17). See MPEP § 608.02(g). Corrected drawings in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.
3. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the subject matter recited in claims 16 and 17 wherein "at least two earth wire leads are connected to the shield electrode and the earth terminal pattern..." must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

The Examiner notes that Applicant's Figs. 3 and 4 are the only figures that show the "connection pattern" (23/35,36 in Figs. 3/4), and in each of these figures, there is only one earth wire lead connected to the shield electrode and the earth terminal pattern

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connected to the shield electrode by the connection pattern (see e.g. claim 16, lines 2-4). Perhaps Applicant intended to refer to a different earth terminal pattern of the filter? (See also the § 112 rejection below).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Claim Objections

4. Claim 19 is objected to because of the following informalities:

In claim 19, on line 2, note that "the signal line terminal pattern" should be changed to - - a signal line terminal pattern - - since this feature has not been

previously mentioned in the claim. Alternatively, should claim 19 correctly depend from claim 4 (see lines 3-4 thereof)? Appropriate correction is required.

Claim Rejections - 35 USC § 112

5. The following is a quotation of the second paragraph of 35 U.S.C. § 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 7, 16 and 17 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 7 recites the feature "the earth wire leads" on line 2 thereof. There is insufficient antecedent basis for this feature in the claims. Should claim 7 correctly depend from either claim 4 (see the last two lines thereof) or claim 6?

Regarding claims 16 and 17, since as discussed in the drawing objection above, the structure wherein "at least two earth wire leads are connected to the shield electrode and the earth terminal pattern" (see lines 4-5) that is connected to the shield electrode by a connection pattern (see lines 2-4), the claims are unclear as to what "earth wire leads are respectively connected to the earth terminals disposed at both sides in the package, sandwiching the surface acoustic wave element" (see lines 5-7). Did Applicant intend for "the earth terminal pattern" recited on line 5 to be a different earth terminal pattern of the filter than the one recited on line 2? As noted above each of Figs. 3 and 4 only show one earth wire lead connected to the earth terminal electrode connected to the shield electrode by the connection pattern. Clarification is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1, 2, 5, 8, 18 and 19 are rejected under 35 U.S.C. § 102(b) as being anticipated by Lee U.S. 5,864,260.

Regarding claims 1 and 18, Fig. 4 of Lee discloses a surface acoustic wave (SAW) device that is a monolithic SAW duplexer so that instead of placing two SAW chips in one package (see col. 2, lines 1-5 and Fig. 2), only one SAW chip for both transmitting and receiving will be placed in the package (see Fig. 3 and col. 2, lines 23-42), there being a SAW filter for transmitting and a SAW filter for receiving on the same piezoelectric substrate 100 (see col. 3, lines 38-41) the SAW device comprising: a first SAW filter structure being a transmitting resonator filter 120 having a first center frequency F1 (see e.g. col. 4, lines 25-28); a second SAW filter being a receiving resonator filter 160 having a second different center frequency F2 (see col. 5, lines 6-10); and a shield electrode 190 between the first filter structure 120 and the second filter structure 160, which is connected to an earth terminal via bonding pad 180 of the package to be grounded (see col. 4, lines 13-18). Note that any grounded electrode between filters inherently provides electromagnetic shielding between the filters.

Regarding claim 2, a connection pattern (not labeled) connects the earth terminal patterns of the first and second filters, being the earth/ground terminals of interdigital transducers (IDTs) 121, 122 and 161, 162 of the first and second filters, to the shield

electrode 190 (see also Fig. 5). Regarding claim 5, the shield electrode 190 is longer than the first and second filters 120 and 160. Regarding claim 8, the SAW propagation direction is left-to-right, the first filter 120, shield electrode 190 and second filter 160 are placed, in that order, in the vertical up-down direction, being perpendicular to the propagation direction. Regarding claim 19, the first transmitting filter 120 has input/output signal terminal patterns connected to the signal terminals of IDTs 121, 122 from bonding pad 110, and to microstrip line 130 and bonding pad 140, respectively, and the second receiving filter 160 has input/output signal terminal patterns connected to the signal terminals of the IDTs 161, 162 from bonding pad 140 through transmission frequency blocking filter 150, and to bonding pad 170, respectively.

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. § 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 1, 2, 4, 5, 8, 9, 11, 16, 18 and 19 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Taniguchi JP 2003-051731 (cited by Applicant) in view of Lee U.S. 5,864,260.

Regarding claims 1, 18 and 19, Fig. 4 of Taniguchi discloses a SAW duplexer having on the same piezoelectric substrate, a first filter 1 for transmitting with a first relatively lower center frequency, a second filter 2 for receiving with a second relatively

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higher center frequency (see e.g. lines 1-3 on page 5 of 6 of the attached machine translation), and an electrode 9h between the first filter 1 and the second filter 2, the electrode 9h being connected to an earth terminal 5b of the package to be grounded, and crossing under a wire from a signal line terminal pattern 9g (wired to terminal 8) is an output terminal pattern of the second receiving filter (see the location of ground 5b in Fig. 3). Regarding claim 2, a connection pattern 15 connects an earth terminal pattern of the parallel resonator 4b of the second receiving filter 2 to the ground electrode 9h. Regarding claim 4, the ground electrode connection pattern 15 crosses a signal wire lead (i.e. the wire to pad 8). Regarding claim 9, both of the filters are ladder circuits (Fig. 3), and a SAW resonator 4a connected to pads 9d/5a in the first lower frequency filter 1 that is nearest (i.e. in distance on the substrate) to the second filter 2 is a parallel arm resonator, and a SAW resonator 3b connected to pads 9g/8 of the second filter 2 that is nearest to the first filter 1 is a series arm resonator. Regarding claim 11, the first and second filters are disposed in parallel to a SAW propagation direction being left to right in the figure (i.e. similar to Applicant's Fig. 8). Regarding claim 16, filter 2 has the higher frequency and the connection pattern 15 and two earth wire leads are respectively connected to the connection pattern and the earth terminal pattern of resonator 4b (connected to pad 9f) and to earth terminals 5b and 5d disposed at both sides in the package, sandwiching the SAW filter 2.

However, Taniguchi does not identify electrode pad 9h as a "shield electrode" (see e.g. claims 1 and 2), does not disclose a shield electrode longer than the first and second filters (claim 5), does not show at least two earth wire leads from the shield

electrode to ground terminals of the package (claim 4), and does not disclose the filters and the shield electrode disposed vertical to the SAW propagation direction (claim 8).

It should be noted that any grounded conductor pattern can be considered a "shield electrode" since a ground pattern inherently provides electromagnetic shielding, such that an extension of pad 9h (Taniguchi Fig. 4) and any connection electrode 15 attached thereto, all being then an integral ground electrode is considered a "shield electrode". Furthermore, as discussed above, Lee (Fig. 4) clearly discloses placing a ground shield electrode 190 between two SAW filters of a duplexer formed on the same chip, the shield electrode being longer than the two filters. Regarding claim 4 requiring two wires, note that Taniguchi does disclose that there be "at least one crossing part" between the ground and signal wiring (see e.g. section [0026], and the last 5 lines of each of claims 1 and 2 in the attached machine translation).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to have modified the SAW device of Taniguchi (Fig. 4) by having extended ground electrode pad 9h to be a ground line shield electrode between the two filters 1 and 2, and to have connected another ground wire thereto, because such an obvious modification as a ground shield extending all of the way between two SAW filters of a monolithic duplexer would have been obvious as suggested by the exemplary teaching thereof by Lee (Fig. 5), because it would have provided the benefit of electromagnetic shielding between the two filters as would have been known by one of ordinary skill (see also other art of record as evidence), and the benefits of miniaturization and enhanced TX/RX signal separation as suggested by Lee (see col. 2, lines 32-42), and connecting another grounding wire to the shield electrode to cross the

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signal electrode is implicitly suggested by Taniguchi, since one of ordinary skill would have known that "at least one crossing part" recited by Taniguchi (ibid.) included two crossing parts requiring two grounding wires.

Regarding claim 8 and the disposition of the filters in a direction vertical to the SAW propagation direction rather than parallel thereto (see Applicant's Figs. 1, 3, 4, 5 and 7 vs. Fig. 8), such a modification of Taniguchi (Fig. 4) as rotating the filters ninety degrees would have been obvious to one of ordinary skill in the art at the time the invention was made because it would have been a mere rearrangement of parts well within the routine knowledge in the SAW filter duplexer art (see also other art of record as evidence).

Allowable Subject Matter

11. Claims 3, 6, 10 and 12-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

12. Claim 17 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims.

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Cheema et al. U.S. 7,196,594 discloses using shield electrodes 60 and 61 (Fig. 5) arranged obliquely between SAW filters in a SAW duplexer, and shows ladder filters disposed vertical to the SAW propagation direction.

Tsutsumi et al. U.S. 7,030,716 also discloses shield electrodes 210, 210a-210c (see Figs. 18 and 20A-C) between SAW filters in a SAW duplexer.

Sato et al. JP 5-299969 discloses a conductive "shield electrode" between two SAW elements 2a, 2b on a single substrate 1 to provide electromagnetic (electrostatic) shielding therebetween (see Fig. 1 and the abstract, the last 5 lines thereof).

Kadota et al. U.S. 6,297,712 discloses a SAW duplexer (see Fig. 6) with a grounded shielding electrode 58 between the filters for eliminating the electromagnetic interference therebetween (see e.g. col. 5, lines 1-10).

Ikata et al. U.S. 6,380,823 discloses two SAW filters on one substrate as a duplexer or a diplexer (Figs. 32, 31 respectively), and shows extending the ground terminal electrodes between the filters [see especially Figs. 31 (b) and 32 (b)], and provides evidence of arranging ladder filters vertical to the SAW propagation direction.

Takeda U.S. 6,943,649 provides evidence that any grounded electrodes 215 (see Figs. 2, 6, 8-10, 12 and 13) on a SAW filter substrate, even with only one SAW filter on the substrate, provide shielding (see e.g. col. 8, lines 31-36).

Urabe et al. U.S. 6,566,981 provides another example of two SAW filters on one substrate separated by a ground "shield electrode" (see Fig. 19).

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14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to BARBARA SUMMONS whose telephone number is (571)272-1771. The examiner can normally be reached on M-Th, M-Fr.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bob Pascal can be reached on (571) 271-1769. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

bs
February 3, 2008

(1 Attachment)
[machine
translation]



BARBARA SUMMONS
PRIMARY EXAMINER

Replacement Sheet
Approved for Entry
2/1/08 BS

"REPLACEMENT SHEET"

15/15

List of Reference Marks in Drawings

10, 25, 30, 45, 50, 60, 65, 70, 75, 300 : SURFACE ACOUSTIC
WAVE DUPLEXER (SAW DUPLEXER)

11, 22, 42, 46, 55, 64, 80, 304 : SURFACE ACOUSTIC WAVE
ELEMENT (SAW ELEMENT)

12, 51, 81, 301 : PIEZOELECTRIC SUBSTRATE

13, 52, 82, 302 : TRANSMISSION FILTER

14, 53, 83, 303 : RECEPTION FILTER

15, 32, 44, 47, 54, 62, 66, 84 : SHIELD ELECTRODE

16, 56, 85, 204, 305 : PACKAGE

17, 57, 86 : JOINING PORTION

18, 58, 87, 306 : TERMINAL PORTION

19, 59, 88 : BOTTOM PORTION

20, 307 : WIRE LEAD

23 : SECOND CONNECTION PATTERN

33 : FIRST SHIELD ELECTRODE

34 : SECOND SHIELD ELECTRODE

35 : FIRST CONNECTION PATTERN

36 : SECOND CONNECTION PATTERN

131 : TRANSMISSION-SIDE EARTH TERMINAL PATTERN

132 : TRANSMISSION-SIDE SIGNAL TERMINAL PATTERN

141 : RECEPTION-SIDE EARTH TERMINAL PATTERN

151, 541, 621, 661, 841 : SHIELD TERMINAL PATTERN

181, 182, 183, 184, 581, 871 : EARTH TERMINAL

185 : SIGNAL TERMINAL

201, 202, 203, 204, 205, 207, 208, 210 : EARTH WIRE LEAD

206 : SIGNAL WIRE LEAD

521, 531 : COMB-SHAPED ELECTRODE

821, 831 : RESONATOR

2032, 3031 : CONNECTION TERMINAL PATTERN